CHAPTER 3
A THEORETICAL PENETRATION OF SOME PRINCIPLES FOR ORDERING (ARRANGING) LEARNING MATERIAL

3.1 INTRODUCTION

In this chapter, there is a delimitation and description of principles of ordering learning material which seem to be of significance for implementation in planning lesson situations in physics. Since the aim is not to provide a complete explication of all the principles of ordering, a few are considered in depth. Thus, the essential characteristics of the relevant principles for practice are made visible.

In dealing with the principles of ordering the learning material, the following question arises: Where have the so-called principles of ordering acquired their clarity? To try to give greater certainty to my argument, I explore an answer to this question: A principle acquires its clarity when certain characteristics, which are repeated in practice, are noticed and described by a didactician. As an example, we can take the methodological principles. Methodology is the science concerned iwith delimiting, systematizing, and describing what can be crystallized from practice as the essentials of methods which are repeated in various situations. Didactics is the only comprehensive science which includes, to a degree, the phenomenon of ordering learning material and the principles connected with it. However, to this day, this problem is still not handled and investigated scientifically. This implies that the current and generally acceptable ways of ordering learning material in practice, and which usually leads to fruitful learning and teaching still rests largely on chance. Consequently, such principles cannot merely be accepted for the aim of this study, and the significance of each of the principles of ordering must be shown. It remains a task for a didactician to scientifically work through the whole matter of ordering.

Because the principles of ordering considered here have relevance for learning content, first some of their aspects are broached.

3.2 LEARNING MATERIAL[23]

3.2.1 The place and value of learning material

In looking for deductions which can be made from the root word *didaskein*, the following are distinguished:

Didakalos means teacher.
Didaskalia means the occupation of teaching.
Didache means the content which must be taught.[24]

From this, content is necessary in designing each didactic situation. Instructing, as essential for all teaching, only can be realized if there is something (content) selected and presented. Furthermore, educating is meaningful because it is only possible for a child to arrive at an understanding of values and norms frim content (something). Thus, the content is the basis for a child changing. This event of becoming is intertwined with the entire phenomenon known as learning. To bring about optimal forming and changing of a child, the content must first be made one's own learned possession. The change resulting from a child lived experiencing the things around him/her is not merely a gnostic [cognitive] event. This forming also includes pathic [affective] moments, which means forming claims a child in his/her totality. Therefore, this not only involves *what* is presented, but also its *why* and *how*. In addition, the "how" implies thinking about and refining the concept of ordering. From this, the learning activity in school can only be re-constituted as a spontaneous, near-to-reality event when the content is selected and ordered in terms of didactic principles. Only then can the structure and meaningful relations of the subject area be unlocked *meaningfully* for a child.

3.2.2 The sense of learning content

[23] The question of learning content (learning material) is comprehensively described in the didactic literature; therefore, only a few aspects are broached with the aim of ordering learning material.
[24] Van der Stoep, F. and O.A., *Didaktiese Orientasie*, p. 37.

Van der Stoep[25] indicates that the sense of a matter, object or activity, for a pupil, is in the necessary harmony between its subjective (personal) and objective (thing-like) aspects. Here the subjective refers to a person who, because of the meaningfulness of the matter (object), gives meaning to it. In a lesson situation, a child is addressed by the form as well as by the content. If the above two aspects appear to be familiar to a child because the event is meaningful, he/she will show grater mobility and will assume his/her own (subjective) standpoint toward them. Therefore, receiving instruction also serves the aim that the sense of the object or matter, the demands of the historical-societal situation, as well as the assumptions and expectations of a child regarding, e.g., the view of life, the sociological, psychological, ethical, the religious are integrated into a new unity, and can be transferred to the lifeworld outside the school. Understandably, the transfer of the new knowledge leads to a deepening of the relationships he/she constitutes with the world outside the school.[26]

Thus, a teacher attempts, through an ordering and presentation of learning content, to create the possibilities by which a child can arrive at a spontaneous involvement with reality. In addition, his/her design must include the opportunity by which the different learning content can grow together into a meaningful and sensible unity and, at the same time, show a correspondence with the life patterns of the adult. Van der Stoep says of this: "The *I* and the *you* of the learning situation now flow together into an *us* in a common concern with the learning material."[27]

3.2.3 Formative content

On the one hand, formative content is characterized by the fact that, as an example, it can appear in the place of many other examples. On the other hand, in terms of content with formative value, certain fundamental problems, fundamental relationships, principles, laws, values and general methods can be made visible. Each specific formative content inherently includes a general formative quality. The success of the work of forming, however, cannot be predicted

[25] Van der Stoep, F., *Didaktiese Grondvorme*, pp. 86-89.
[26] Van der Stoep, F., op. cit., pp. 86-90.
[27] Van der Stoep, F., *Tydskrif vir Geesteswetenskappe*, June 1965, p. 214.

and guaranteed beforehand. Certainty about the value of a matter can only be observed in the results of the formative event, and only to the extent that success is attained in unlocking a specific reality.[28] This unlocking of reality means that a child has come to learn to know and master the unknown and comprehensive lifeworld of the adult. Van der Stoep indicates that an approach in a specific teaching situation can contribute to elevating the formative effect of the learning content.[29] The presentation, which must shape the form, at the same time must remain directed to unambiguously unlocking the essence of the theme for the pupils and allow it to be integrated with their already existing knowledge. Once again, we emphasize the importance of each lesson situation being planned in its form and content before a presentation can have optimal formative value and quality.

3.2.4 Reducing the learning content

A person interprets reality mainly from the structures which its character of being allows to become visible, i.e., what he/she has accepted as true and valid. The first and most important step in lesson analysis is to isolate the quality or being-character of the learning content. This is the only way to realize the category "unlocking reality". In other words, a didactic analysis must disclose the essential of a concept, as well as show its mutual relations with other matters. Only when there is clarity about what is essential to a piece of reality, and when it can be seen in relation to neighboring matters, can a teacher interpret and represent for the pupils this matter (reality) as a piece of lived experience. However, each person acquires experience from the appeal arising from the matter itself, and because of the personal stake of the learner in his/her search for truth and sense.[30] In other words, a teacher must take care that the formative content he/she presents to the pupils directs an appeal to them by which they purposefully and deliberately try to solve a problem.

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[28] Van Dyk, C.J., *Vanaf vorming (Bildung) tot Eksempariese onderrig en leer—'n Didakties-Pedagogiese Strukturering*, p. 21.
[29] Van der Stoep, F., op. cit., p. 95.
[30] Van Dyk, C.J., op. cit., pp. 19-22.

Van der Stoep refers to the importance of the reduction step when he says an adult's activity of reduction always is ordering in nature.[31] This places a teacher under the imperative to give an indication of matters which, from his/her insights acquired through the activity of reduction, he/she regards as important and of which a child must acquire a grasp. *From this it is, in a didactic analysis the reduction of learning content is a primary and necessary step which must be carried out before the learning content can in any way be ordered further in terms of principles*. Thus, with any further reflection on the problem of ordering learning material, the disclosures by the act of reduction always must serve as the primary point of departure.

However, in daily practice, a teacher is involved with a syllabus to which, in part, he/she is bound and from which his/her learning content must be selected. It is not the primary purpose of this study to draw conclusions about ordering learning content in a syllabus. However, to come to an ordering of learning content for lesson situations, the compilation of the syllabus necessarily must have relevance. Therefore, it is necessary to comment about syllabi and their significance for planning lesson situations.

3.2.5 Learning content and the syllabus

a) *The concept syllabus*
In a syllabus summsrizes a concrete description as well as a systematic ordering of learning content for a school to present over several years of study. It reflects a first analysis and ordering of cultural material. The syllabus concretizes the abstractly given teaching aim, especially regarding its content, and makes this aim manageable in daily school life.[32]

Often the detail of the syllabus content is not clearly distinguished, but only the general fundamental problems and embracing thematic fields are shown. The choice of particulars is left to an individual teacher or school. Here, one thinks of two types of syllabi—the core syllabus and the minimum syllabus.

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[31] Van der Stoep, F., op. cit., p. 31.
[32] Oosthuizen, J.H.C., *Die leerplan van die primere skool as opgaaf aan die kind*, p. 8.

b) *Syllabus compilation*

Nature of the learning content. The fundamental ideas of syllabus compilation is its being scientific (objective or subject directed), while the syllabus content is viewed as the means for presenting the culture-creating authorities, e.g., the church, judiciary, science, arts and vocational being. Any didactically accountable construction of a curriculum must characterize the essence of the learning material. The themes taken up in it must be selected for their formative quality. There must be an opportunity allowed for a child to redisclose a theme in situations which are original and near to reality. In this way, insights arise from confusion, solutions again become tasks, and phenomena again become primordial phenomena.[33]

Ordering the learning content. In a didactician's reflection on the compilation of a curriculum, he/she can and must be clear about the principles of ordering he/she will implement with respect to the learning content. Here, we only mention a few possibilities of ordering, e.g., the progressive, the concentric and the symbiotic.

In lesson situations which re important for this study, the principles of ordering can figure separately or jointly. Each principle of ordering is given detailed attention with the aim of showing in which ways it can be implemented in a lesson situation. This study does not deal so much with the relevance of each of the principles for compiling syllabi.

3.3 PRINCIPLES OF ORDERING LEARNING MATERIAL

From the abundance of cultural content, certain content or areas are selected, taken up and ordered in a syllabus. This content already characterizes the essentials of the learning material considered necessary for educating and teaching a child who is on a certain level of becoming. However, a teacher cannot merely adopt and present the syllabus content. As a first step, the learning material must be reduced to its essentials by stripping it of all supplementary information. Only then can a teacher avail him/herself of its

[33] Van Dyk, C.J., op. cit., p. 23.

formative value and arrive at the essences which have made it worth taking up as a problem in the syllabus. A teacher must not merely suffice with a chronological ordering. For him/her, as well as for ta learning person (pupil), knowledge of the structure of the formative content is of utmost importance. The simplicity or complexity of the content is determinative of the form and level of ordering and, finally, of the method which is to be followed.[34] In his/her teaching, a teacher must apply him/herself to unlocking the essence of the formative content for the pupils. The problem regarding presenting the learning content (physics problem) is that it must become a problem which totally claims the pupils, and which arouses their wonder and amazement. In this way, the necessary enthusiasm, questions and interest of the pupils are stimulated and motivates them to discover for themselves.

Specific principles of ordering now are dealt with because of their relevance for the natural sciences in general and specifically for physics.

3.3.1 The principle of core learning material and supplementary programs

The fundamental insight of this principle is the idea of core learning material, as well as a further orientation of the entire group of pupils, or only certain of them, by bringing in supplementary programs.

For the various subject areas, it is known that depth can be acquired in teaching by looking for “elementals”, fundamentals, and pregnant cases. The aim of presenting core learning material crystallizes in the teaching of formative content which possesses an inherent formative quality.

Where use is made of this principle to order the learning material in teaching, there must be an attempt to bring about the right relationship between learning material flooding (factual knowledge) and the concentration of learning material (core learning material), where the latter necessarily is taken as a fixed point. Here, there is

[34] Van Dyk, C.J., op. cit., p. 31.

a close connection with the concept of the "elemental" as investigated and described thoroughly by Klafki. The fruitfulness of the idea of the "elemental" is that it brings the learning content to the center of our contemporary didactic discourse. Again, the idea has arisen for a didactician that, to acquire insight into the essences of reality, a reduction of the formative content to its "elementals" must be an aim.[35]

Core learning material must possess the possibility of being vivid or illustrative and, as an example, possess the quality of unlocking or reflecting a general structure or idea. Roth[36] also indicates that, in teaching, a "core point" (core learning material) must be sought on which to concentrate. In practicing a science, we must have the courage to "remain open", or more positively stated, to have the courage to be more thorough. However, he also refers to the necessity that there cannot be teaching only in terms of core learning material because, according to him, gaps can arise and be catastrophic. Therefore, in addition to the core learning material, supplementary learning material must be offered by which there is a further orientation. Van Gelder calls this broader provision of information supplementary programs. The concept "supplementary programs" is only didactically justifiable when it is supplemented with the core learning material. Further, core learning material lends itself to being implemented as content in relation to the exemplar, as a ground-form. Therefore, a teacher must continually ask him/herself what he/she is doing and how. He/she must be able to thoroughly answer with respect to the time when, and the tempo with which he/she implements the core learning material and supplementary programs in interaction with each other. In connection with the question of core learning material, there is a concentration on mastering fixed points from which a better perspective on the matter can be acquired. The mastery of such points of orientation offers the pupils greater confidence and a better overview of the entire structure.

To grasp the significance of core learning material, attention also is given to a child's level of readiness, and its influence on the choice

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[35] Van Dyk, C.J., op. cit., p. 166.
[36] Roth, H., *Leerpsychologie in Pedagogisch Perspektief*, p. 276 et seq.

and ordering of a topic. This confronts a didactician with the task that, in his/her planning, he/she must try to bring about a harmony between the content which will be most fruitful for unlocking a reality and the receptivity of a child at this/her level of becoming. Such a choice must be made from a broad field of available learning content by a search for the core learning material within it. After mastering the core learning material, individual pupils can follow the supplementary programs according to their interests. In this regard, the concept of core learning material and supplementary programs connects very well to the principle of individualization because here there also is an accounting of individual differences.

In summary, a few important advantages of this principle of ordering, especially regarding the teaching of natural science, are noted:

i) In the concept "core learning material" there is clear mention of a concentration of learning material on fundamental and necessary learning content. In physics, this especially gives us the opportunity to meaningfully apply the example as a ground-form.
ii) By the right choice of learning content, a didactician can avoid working on less important learning material too soon and at too fast a tempo. In this way, an overloaded learning program is lessened.
iii) In his/her preparation, a didactician must plan situations in which a child's astonishment and wonder are aroused and, thus, arrive at a meaningful problem from a child's experiential life. His/her learning aim must be: Original lived experiences by which a child penetrates to the essential of the matter.
iv) The principle of individualization is prominent. Individual pupils now work on theoretical and practical assignments with respect to both the core learning material and the supplementary programs and, thus, have more opportunity for independent participation in the teaching.

Some dangers with this are indicated:

i) The core learning material is not always chosen in a didactically accountable way. In this connection, Van der Stoep indicates that it is the task of a didactician to express him/herself about what content is valuable and worth knowing.[37]
ii) To have any success with this principle and programs high demands are placed on a didactician because an incorrect handling of them can have serious consequences for the learning event.

3.3.2 Principles with the life world of the child as point of departure

a) *Symbiotic principle of ordering*
The concept symbiotic comes from the Greek *sum* which means together and *bio* that means to live. The literal translation, thus, is "living together." Symbiotic teaching is a form of teaching by which a child is directly brought into contact with reality, as far as is possible and desirable.

The influence of the environment is especially great during a child's first years of life. However, gradually he/she loosens him/herself from the world, i.e., he/she distances him/herself from things by increasingly thinking about them on a gnostic [cognitive] level. In this way, he/she arrives at a more ordered way of constituting his/her own lifeworld. Aarts[38] further indicates that there is a close correspondence between the modes of learning of a toddler and the beginner of a primary school. For both groups, the learning activity is carried by a subjective attunement which results in moments of spontaneous play and lived experiencing totalities. He further states the precondition that learning material taught in the first years of school must find close links with earlier experiences of the lifeworld of a child, because this experienced and lived foreknowledge already has meaning for him/her. In the second phase of the primary school, i.e., approximately the last three years, in his/her learning relationships, a child penetrates to the matters themselves. Now he/she is much more gnostically [cognitively] attuned and directed to reality. In his/her learning activity, he/she searches for

[37] Van der Stoep, F. and O.A., *Didaktiese Orientasie*, p. 220.
[38] Aarts, J., *Beknopte leerboek der algemene didaktiek*, p. 110.

things as they are. Thus, he/she breaks through the pathic [affective] and turns him/herself to the gnostic [cognitive] by which he/she seeks meaning.[39] Now, he/she is ready for logical-rational methods.

The above argument implies that links must be found with physical phenomena in nature which a child already has experienced. The at hand and mear to reality lived experiences of a child offer the possibility for a fruitful integration with the new learning content. By implementing the symbiotic principle, not only is acquiring the necessary integration of the different subjects aimed at, but the content also must be fruitfully applicable in a subject area.

b) *Principle of local lore*
Since this principle is closely related to the symbiotic principle, an explication of it is justified at this stage. With the concept "heem" (Dutch), Aarts understands the material and spiritual environment in which a person lives and with which he/she is in relationship.[40] The significance of *Heimat* (German) for teaching is that the known and at hand experiential world of a child serves as the point of departure. Because of his/her experiences of local lore, a child now is enabled to meaningfully constitute his/her lifeworld. The lifeworld is the sublimate of a person's meaning giving consciousness. The local lore experiences are united into a unity of meaning in which a particular thing refers to other things in constellations of meaning. From this trusted and known world, a person moves to the strange and unknown. It is the basis of all conceptual truth of the world twhich is lived and lived experienced.[41]

Significance of the local lore principle for ordering learning content

- In planning and designing a lesson situation, links must be found with the experiences of a child. The immediate environment or region can serve fruitfully as the first point of departure for a teaching event.

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[39] Sonnekus, M.C.H., *Die leerwereld van die kind as beleweniswereld*. P. 110.
[40] Aarts, J., op. cit., p. 193.
[41] Gous, S.J., *Die skool as weg tot wereldontwerp in didakties-pedagogiese perspektief*, p. 19.

- A child must not only learn to know the concepts, but he/she also must learn to see their mutual relationships. These mutual connections among concepts can best be indicated when one proceeds from the totality of a child's lived experiences.
- Our ordering of learning content, therefore, must be of such a nature that it corresponds with a child's level of becoming and learning readiness.

This brings us to the integration principle of ordering. which is closely connected with both the ideas of "living with" (*symbiosis*) and *local lore*.

c) *Principle of integration*
As a principle for ordering learning material, it is attuned to eliminating all dividing lines between areas of learning material. The essence of the idea of integration is that the choice of and ways of ordering themes are attuned to learning material which can be built up (ordered) into a coherent whole. The origin of this principle must be sought in the knowledge that a child mainly lived experiences reality as a global unity or whole. Thus, it is related to the idea of totality teaching.

This principle of ordering rests on the following:[42]

- The learning material content shows a clear coherence which usually emanates from a core problem. Thus, this point of departure is a search for the co-experienced coherences so that matters evoked by the core appear. (In this respect, this links up with the principle of core learning material.)
- The point of departure assumes that the learning material is taken from directly present life situations. This coherence is the coherence which a child would have experienced in real life. (In this respect, it links up with the symbiotic principle). This leads to a child experiencing coherence in particular learning activities. Thus, insight is acquired into the mutual relations

[42] Van der Stoep, F. and O.A., op. cit., p. 217.

between the concepts which form part of everyday reality.
- Obviously, the learning situation designed with the help of such learning content must be motivating and lead a child to an active participation.
- In evaluating the acquired knowledge, the emphasis will not be on demanded knowledge or manipulated techniques, but on the success which the pupils achieve on actualization tasks.

However, in this study, dealing with implementing ordering principles within a subject area, the integration principle can only have limited value regarding the choice and ordering of topics. For the general forming of a child and his/her causal understanding of natural phenomena, however, it is of such primary importance that thorough attention is given to the mutual relationships among the various natural sciences.

In addition to these principles of ordering, which are more directed to the use of a child's at hand experiences, there are some other principles which deserve attention.

3.3.3 The concentric principle

The concentric principle initially served mainly as an opposition to the subject class (progressive principle*) which does not allow for the fact that sometimes pupils are unable to deal with a specific part of a subject at a certain age.[43] The fundamental idea behind concentric ordering is that a subject or subjects should be presented for several years with the subject becoming progressively more difficult. According to this principle, the learning material itself does not have an undue autonomy but the primary consideration is a child's learning readiness. The concentric principle is only *meaningful* when it is based on a psychological finding (psychology

* "The progressive principle is not feasible in practice. What it amounts to is that the various subjects … are not taught parallel to one another, or simultaneously, but consecutively. A certain subject or part of it is concluded in its entirety, before one proceeds to the next." (Van der Stoep, F. and O.A. *Didactic Orientation* (English Edition), p. 110. Johannesburg: McGraw-Hill, 1973. This footnote was inserted by G.Y.

[43] Van der Stoep, F. and O.A., op. cit., p. 215.

of becoming) which helps to attain a harmony between learning readiness and level of difficulty. This ordering can be applied fruitfully in various subject areas.

In planning for teaching a subject, this involves the mastery of fundamental concepts, but also good judgment in determining the level of difficulty by a teacher. The concepts must be ordered and presented in accordance with a child's level of readiness. As a child progresses in understanding and handling concepts, he/she becomes linguistically and methodologically refined. In this way, he/she uses and applies the fundamental concepts more formally, correctly, and scientifically.

The concentric principle does not only belong in a syllabus presented over several years, it also can be used with a certain theme or concept in subsequent lessons, or even in the same one. In the natural sciences, e.g.,in physics, most concepts are complex and can only be made understandable by a logical building up of structures and generalizations. Based on the insights and knowledge disclosed by reducing the learning material, a presenter discovers that mastering such a difficult concept is only possible when there is an analysis worked through to related characteristics. The consequence of this is that, after each analysis, there must be an opportunity for a synthesis. However, to also account for a child's learning readiness, a didactician is forced to work concentrically, and to build up only such structures which are within a child's intellectual grasp.

3.3.4 The linear principle

In contrast to the concentric principle, in using this principle, one strives in direct ways, i.e., linearly, to build up to the learning aim and to hold out the prospect that the theme thus can be dealt with. Therefore, here it is necessary that a teacher first analyze the theme into fine details so that, in implementing the linear principle, he/she can anticipate in what ways the subparts can again be united into a whole of knowledge or a greater unity. The matter of reducing the learning material, once again, enters the foreground. Thus, a teacher must not only analyze the learning material, but also penetrate to the essentials or elementals of the matter.

The linear principle is popular in programmed instruction. In business, we find almost 80% of available programs follow such an ordering. The learning content is subdivided into small units (packets) and then each is presented separately in so-called frames. The learning of a child progresses in this way by a fixed sequence of several small learning steps which sometimes obscures the synoptic understanding of the whole.

3.3.4 The punctual (divergent) principle

This way of ordering assumes that, in designing his/her lesson, a teacher tries to give a systematic explication of the theme from a chosen center (thesis). Thus, here there is work from a complex theme or definition from which several characteristics or part-structures can be delimited. Then, each of these aspects alternately is dealt with, after which there again is a return to the original main theme as point of departure. By separately disclosing each characteristic, usually in terms of a linear or spiral *part ordering*, a child acquires a new perspective on the matter, and there is a continual elevation in level. This principle of ordering is closely related to a deductive methodological approach, by which comprehensive tasks and projects can be implemented.

In physics, we can apply this principle by, e.g., stating a definition, or general law for the pupils, and providing an opportunity for a degree of memorization of the component aspects. After that, the separate aspects of the general thesis are delimited and investigated by the pupils with appropriate examples. This orienting learning activity can take the form of directly perceiving nature itself, as well as the form of a demonstration lesson. By exercising these learning activities, the pupils can apply the concept in new situations. At the same time, a pupil can acquire experience by which an aspect or area of application of the phenomenon can be explained better. If later all the data possibly become integrated by means of a class discussion, the pupils can, from the various points of view, construct a synoptic image of the central concept.

In physics, there are concepts which can be ordered and presented in this way. We mention only a few, such as interference, energy

and watt. Some of these concepts are dealt with at length in the last chapter.

3.3.5 The chronological principle

In applying this principle, the learning material is explained and successively dealt with in the same sequence it was disclosed and described by scientist through the centuries. As a principle of ordering, it can be fruitfully applied in the natural sciences, especially where the historical course of theories can help the pupils to delimit their subparts (part-perspectives). In the past, various theories in physics were formulated and accepted as valid, which later had to be rejected because of new insights. (An example is the particle and wave theories regarding the nature of light.)

In implementing the chronological principle, pupils can acquire better insight into the sense and meaning of a theory from the past. However, it is important to notice that presenting learning content according to the chronological principle, sometimes can give rise to unnecessary resistance and confusion. Any introduction to a theme must seek a connection with the *recent views* about it. The pupils must always be confronted with the truth. Only *after that*, if didactically justifiable, is the course (of the past) brought in, if the aim is to give the pupils a broader perspective on the whole theme.

Implementing the principles of ordering for a lesson situation by no means is an isolated matter. There are matters which influence the choice of a principle of ordering, and certain aspects of these are now pointed out.

3.4 THE CHOICE OF A PRINCIPLE OF ORDERING

Before a principle is chosen, there are certain aspects which must first be considered. On the one hand, viewed from general didactic *theory*, it is the didactic principles which allow the categorical and aim structures to acquire relevance. On the other hand, viewed more from practice, certain principles of ordering lend themselves better than others to bringing into motion the interaction between ground-form and methodological principles. From this interaction,

a lesson acquires a specific form. Now we deal in more detail with some of these aspects.

3.4.1 The meaning of the didactic principle

Before being able to make a final choice of a principle of ordering for presenting a specific slice of reality, a didactician must first ask him/herself what is the sense and meaning of the didactic principles for practice. Because planning and preparing each lesson is done for a specific class, group or child, the didactic principles, such as individualizing, offer an immediate starting point from which an event can be brought into motion. Only thusly can learning content be ordered for a specific lesson situation in terms of a principle which will allow the didactic principles of activity, observation and creativity to occur correctly. The problems and questions of the pupils or class, as well as the aim striven for, necessarily will influence the form of ordering in which the lesson is set. Irrespective of the mentioned didactic principles, there also are more specific principles which must be considered in ordering learning content for a lesson situation. Here we only mention a few, such as differentiation and a looser class context. This immediately brings us closer to practice.

3.4.2 The relationship among ground-form, methodological principle and form of ordering

An important task in ordering learning content for a specific lesson is to try to bring about a harmony among the interacting structures. Therefore, there must be an allowance for the reciprocal interactions among ground-forms, methodological insights, and principles of ordering. If this occurs, an accountable subject-didactics can be built up which is not left to chance. Thus, before one orders the content for lesson situation, first insight must be acquired into the mutual relations between the following aspects:

a) *Ground-form and learning content*
Here, it is essential that the lesson form pushes its content to the fore.[44] Only when a learning person recognizes the form as an

[44] Van Dyk, C.J., *S.A.Tydskrif vir die Pedagogiek,* July, 1970, p. 46.

everyday way of living, is a lesson event meaningful to him/her. However, in planning a lesson, there must be a decision about what form (ground-form) can make the teaching most effective. The choice of a ground-form for a teaching event is thoroughly influenced by the unique nature and structure of the subject matter.[45]

This mutual relation between form and content is a relationship which gives teaching a unique style. There cannot be *didaskein,* in its original sense, until a form structure (life form) is chosen. In primary teaching situations, such as family educating and teaching, mostly occur in spontaneous ways, while in a second order, or reconstituted teaching situation (school lesson situation) there must be a decision (plan) beforehand about the question: In terms of what ground-form(s) can the unlocking of reality best be brought about? This is one of the primary decisions a teacher must make in planning any lesson situation. This decision also is necessarily influenced by the nature and structure of the subject, as well as by a child's level of readiness. However, it still must be indicated that the choice of a ground-form does not take the initiative out of the hands of a teacher.[46] Thus, for example, in implementing play as a ground-form, there still must be room allowed for rules of play.

This mutual relation between form and content is more closely elucidated in Chapter 4 in terms of some examples from physics.

b) *Form of ordering and methodology*

There is a profound relationship between the ground-form, in terms of which there is going to be teaching, and the methodological principles, which indicate ways in which a child can be brought to the essence of the learning content. When there is choice of a ground-form for a teaching event, the methodological ways which can thereby be followed, already are limited. There is a particularly firm relationship between the ground-form (general way) and a lesson form (specific way).

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[45] Van der Stoep, F., *Didaktiese Grondvorme*, p. 141, et seq.
[46] Van der Stoep, F., op. cit., p. 140.

The relationship between form of ordering and methodological principle, however, is more fluid. For example, if a form of ordering is chosen to present learning content, still any methodological principle can be chosen, depending on the structure of the learning content (theme). When a methodological principle is chosen, the ordering of the learning content must occur accordingly. To amplify, with the use of the inductive principle, there can only be a working from the specific (exemplar) to the general (law). Therefore, the learning content must be chosen and ordered accordingly.

In the last chapter, some examples are presented to elucidate the problem of ordering learning material in a lesson situation.